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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,204	03/26/2004	Daryl Chapman	GP-302076	1948

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EXAMINER	
LEWIS, BEN	

ART UNIT	PAPER NUMBER
1745	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/811,204	CHAPMAN ET AL.	
	Examiner	Art Unit	
	Ben Lewis	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,5 and 8-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5 and 8-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

1. The Applicant's amendment filed on June 14th, 2007 was received. Claims 1, 8 and 9 were amended. Claims 2, 4, 6, 7 and 11-30 were cancelled.

2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action (issued on January 30th, 2007).

Oath/Declaration

3. The Oath filed on March 26th 2004 has been considered but is defective because it was not signed by all inventors.

4. The Declaration under 37 CFR 1.131 filed on under 37 CFR 1.131 has been considered but is ineffective to overcome the Ueda et al. reference because the declaration was not signed by all Applicants

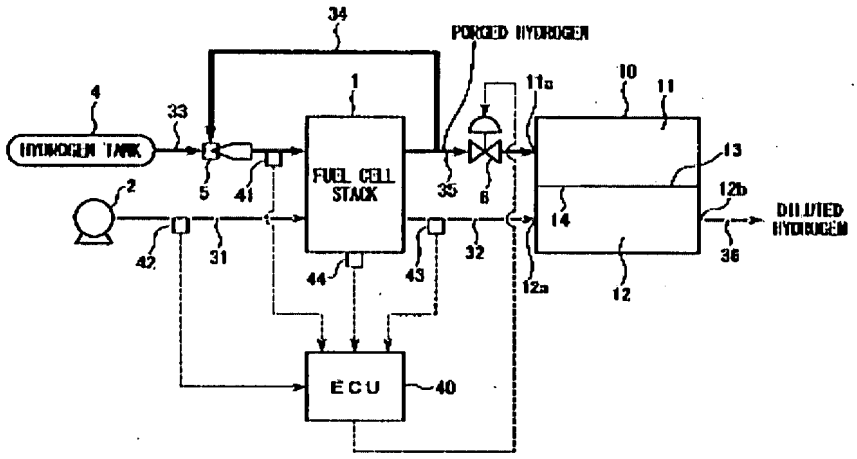
Claim Rejections - 35 USC § 102

5. Claims 1, 4, 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Ueda et al. (U.S. Pub. No. 2004/0013919 A1).

With respect to claim 1, Ueda et al. disclose a hydrogen purge control apparatus (title), wherein air is pressurized by compressor **2** to a predetermined pressure, and the pressurized air is supplied to the cathode of each of the fuel cell units of the fuel cell stack **1** through an air supply passage **31** (Paragraph 0036). On the other hand, hydrogen gas supplied from a hydrogen tank **4** is supplied to the anode of the fuel cell stack **1** through a hydrogen gas supply passage **33** (Paragraph 0037). Ueda et al. also teach that a hydrogen gas purging passage **35** "anode exhaust", which includes a purge valve **6** (bleed valve), branches off the hydrogen gas circulating flow path **34**. The hydrogen gas purging passage **35** is connected to the purged hydrogen dilution device **10**. Note that the purge valve **6** may be substituted by one of various types of Regulators (Paragraph 0038). The purged hydrogen dilution device **10** is a container whose interior is divided by a partition **13** into a holding chamber **11** "accumulator" and

a dilution chamber **12** (combined with cathode exhaust gas) (Paragraph 0039) (See Fig. 1).

FIG. 1



With respect to claims 4 and 5, Ueda et al. teach that during the purging operation in which the purge valve **6** is opened, hydrogen gas purged from the fuel cell stack **1** flows into the holding chamber **11**, and diffuses in the entirety of the holding chamber **11**. When the purge valve **6** is closed, flow of hydrogen gas into the holding chamber **11** is stopped. On the other hand, because the discharged air flows through the dilution chamber **12** regardless of opening and shutting of the purge valve **6**, hydrogen gas remaining in the holding chamber **11** is gradually drawn into the dilution chamber **12** through the communication holes **14**, and is mixed with the discharged air in dilution chamber **12** so as to be diluted. As result, it is possible to lower the hydrogen concentration of the gas discharged from the outlet **12b** of the dilution chamber **12** (Paragraph 0044).

Claim Rejections - 35 USC § 103

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda et al. (U.S. Pub. No. 2004/0013919 A1) in view of Pratt et al. (U.S. Patent No. 6,426,158 B1)

With respect to claim 3, Ueda et al. disclose a hydrogen purge control apparatus (title) in paragraph 5 above. Ueda et al. do not specifically teach a bleed vale selectively bleeding the anode exhaust gas accumulated in the accumulator. However, Pratt et al. discloses a method of diluting hydrogen gas exhausted from a fuel cell (title) wherein in FIG. 3, the hydrogen dilution means **16** "accumulator" consists of an empty holding chamber and an additional valve **30**. In a purging operation, the first valve **14** momentarily opens to release some pressurized reacted fuel gas into the holding chamber, which is initially at atmospheric pressure. The reacted fuel gas is then slowly released or bled into the air by partially opening or pulsing the second valve **30**, so that any hydrogen that is released is at a very small amount, thus keeping the concentration of hydrogen in the surrounding air at less than 4.1% (Col 4 lines 1-15). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the bleed valve on Pratt et al. into the fuel cell system of Ueda et al. because Pratt et al. teach that release of hydrogen into the open air may create a

safety hazard if the concentration of hydrogen is above four (4) percent by volume. It would be an advancement in the art of fuel cell systems to have a dead-ended system that can be purged without constituting a safety hazard (Col 2 lines 20-35).

7. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda et al. (U.S. Pub. No. 2004/0013919 A1) in view Pratt et al. (U.S. Patent No. 6,426,158 B1) as applied to claim 2 above and further in view of Voss (U.S. Pub. No. 2003/0118882 A1).

With respect to claims 8-9, Ueda et al. as modified by Pratt et al. disclose a hydrogen purge control apparatus (title), wherein the hydrogen gas purging passage **35**, which includes a purge valve **6**, which branches off the hydrogen gas circulating flow path **34**. The hydrogen gas purging passage **35** is connected to the purged hydrogen dilution device **10**. Note that the purge valve **6** may be substituted by one of various types of Regulators (Paragraph 0038).

Ueda et al. as modified by Pratt et al. do not disclose wherein the bleed valve is a spring-based solenoid valve. However, Voss disclose a fuel cell system wherein the pressure control mechanism **2** has at least two fuel stream pressure settings, for example sub-atmospheric and super-atmospheric. In normal operation and in response to a signal from the controller, the pressure control mechanism **2** (for example, a pressure regulator) maintains fuel at sub-atmospheric pressure. In response to a signal from the monitoring cell **12** to the controller **10** indicating the accumulation of a high

concentration of diluent gases in the monitoring cell, a control signal activates the exhaust valve **9**, for example a solenoid, and adjusts the spring compression within the regulator to modify its control pressure to super-atmospheric. In the event of an interruption in power to the regulator, the normal feed pressure would be sub-atmospheric (Paragraph 0056).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute a spring-based solenoid controlled valve of Voss for the bleed valve of Ueda et al. as modified by Pratt et al. because a spring based solenoid valve can automatically adjust the opening of the exhaust valve which would lead to more efficient system performance.

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda et al. (U.S. Pub. No. 2004/0013919 A1) in view of Voss (U.S. Pub. No. 2003/0118882 A1).

With respect to claim 10, Ueda et al. disclose a hydrogen purge control apparatus (title), wherein the hydrogen gas purging passage **35**, which includes a purge valve **6**, which branches off the hydrogen gas circulating flow path **34**. The hydrogen gas purging passage **35** is connected to the purged hydrogen dilution device **10**. Note that the purge valve **6** may be substituted by one of various types of Regulators (Paragraph 0038).

Ueda et al. as modified by Pratt et al. do not disclose wherein the purge valve is a spring-based solenoid valve. However, Voss disclose a fuel cell system wherein the pressure control mechanism **2** has at least two fuel stream pressure settings, for

example sub-atmospheric and super-atmospheric. In normal operation and in response to a signal from the controller, the pressure control mechanism **2** (for example, a pressure regulator) maintains fuel at sub-atmospheric pressure. In response to a signal from the monitoring cell **12** to the controller **10** indicating the accumulation of a high concentration of diluent gases in the monitoring cell, a control signal activates the exhaust valve **9**, for example a solenoid, and adjusts the spring compression within the regulator to modify its control pressure to super-atmospheric. In the event of an interruption in power to the regulator, the normal feed pressure would be sub-atmospheric (Paragraph 0056).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute a spring-based solenoid controlled valve of Voss for the purge valve of Ueda et al. as modified by Pratt et al. because a spring based solenoid valve can automatically adjust the opening of the exhaust valve which would lead to more efficient system performance.

Claim Rejections - 35 USC § 102

9. Claims 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Pratt et al. (U.S. Patent No. 6,426,158 B1).

With respect to claim 1, Pratt et al. disclose a method of diluting hydrogen gas exhausted from a fuel cell (title) wherein, a typical fuel cell **10** has two sides, an anode (or fuel) side and a cathode (or air) side. In addition to the anode and cathode, there

are also current collectors, catalysts, a polymer electrolyte membrane, gas manifolds "anode and cathode inlet and outlet lines", fuel storage reservoir **12**, etc. disposed appropriately (Col 3 lines 1-15). Pratt et al. also teach that depicted in FIG. 3, the hydrogen dilution means **16** "accumulator" consists of an empty holding chamber and an additional valve **30**. In a purging operation, the first valve **14** (bleed valve) momentarily opens to release some pressurized reacted fuel gas into the holding chamber, which is initially at atmospheric pressure. The reacted fuel gas is then slowly released or bled into the air by partially opening or pulsing the second valve **30**, so that any hydrogen that is released is at a very small amount, thus keeping the concentration of hydrogen in the surrounding air at less than 4.1% (Col 4 lines 1-15).

Response to Arguments

10. Applicant's arguments filed on June 14th, 2007 have been fully considered but they are not persuasive.

Applicant's principal arguments are

(a) Applicant is submitting herewith a Declaration under 37 CFR {}1.131 to remove U.S. Publication No. 2004/0013919 to Ueda et al. as a reference. Applicant submits that this Declaration shows conception of the invention prior to the effective date of Ueda et al. of July 16, 2003, and due diligence from the effective date to the date of constructive reduction to practice of March 26, 2004. It is thereforerespectfully requested that all rejections naming Ueda et al. be withdrawn.

In response to Applicant's arguments, please consider the following comments.

(a) The Declaration under 37 CFR 1.131 filed on under 37 CFR 1.131 has been considered but is ineffective to overcome the Ueda et al. reference because the declaration was not signed by all Applicants

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben Lewis whose telephone number is 571-272-6481. The examiner can normally be reached on 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ben Lewis

Patent Examiner
Art Unit 1745

PATRICK JOSEPH
SUPERVISORY PATENT EXAMINER